

## CLAIMS

1. A dual input clutch transmission comprising:
  - an input shaft;
  - an output shaft;
  - a stationary ground member;
  - 5 a first selectively engageable input clutch;
  - a second selectively engageable input clutch;
  - a first planetary gearset having three rotatable members;
  - a second planetary gearset having three rotatable members and one continuously stationary member, one of said three rotatable members
  - 10 being continuously interconnected with said output shaft;
  - a first synchronizer clutch means for operatively selectively interconnecting said first selectively engageable input clutch with each of said rotatable members of said first planetary gearset individually;
  - a second synchronizer clutch means for operatively selectively
  - 15 interconnecting said second selectively engageable input clutch with each of said rotatable members of second planetary gearset individually;
  - a third synchronizer clutch means for operatively selectively interconnecting said ground member with each of said rotatable members of said first planetary gearset individually;
  - 20 a fourth synchronizer clutch means for operatively selectively interconnecting two of said rotatable members of said first planetary gearset with said output shaft; and

said first selectively engageable input clutch and said first, third, and fourth of said synchronizer clutch means being engaged in combinations  
25 to establish three forward speed ratios and one reverse speed ratio between said input shaft and said output shaft, and said second selectively engageable input clutch and said second synchronizer clutch means being engaged to establish three forward speed ratios between said input shaft and said output shaft.

2. The dual input clutch transmission defined in Claim 1 further comprising:

said first synchronizer clutch means being a three- way clutch to independently interconnect said first selectively engageable input clutch with  
5 each rotatable member of said first planetary gearset.

3. The dual input clutch transmission defined in Claim 1 further comprising:

said second synchronizer clutch means comprising a three-way mechanical clutch that independently interconnects said first selectively  
5 engageable input clutch with each rotatable member of said second planetary gearset.

4. The dual input clutch transmission defined in Claim 1 further comprising:

said third synchronizer clutch means comprising a three-way mechanical clutch that independently interconnects said first selectively  
5 engageable input clutch with each rotatable member of said first planetary gearset.

5. A dual input clutch transmission comprising:

an input shaft;

an output shaft;

a stationary housing member;

5 a first input clutch means;

a second input clutch means;

a first planetary gearset having a sun gear member, a ring gear member means, a planet carrier member, and a plurality of pinion gear members rotatably mounted on said planet carrier member disposed in meshing relation with both said sun gear member and said ring gear member means;

a second planetary gearset having a first sun gear member, a second sun gear member, a ring gear member, a planet carrier member, a plurality of first pinion gear members rotatably mounted on said planet carrier member and meshing with said second sun gear member, a plurality of second pinion gear members rotatably mounted on said planet carrier member intermeshing with respective ones of said first pinion gear members and also meshing with both said sun gear member and said ring gear member, said second sun gear member being continuously interconnected with said stationary housing member, and said planet carrier member being continuously interconnected with said output shaft;

a first synchronizer clutch means for selectively individually interconnecting said first input clutch means with said sun gear member, said ring gear member, and said planet carrier member of said first planetary gearset;

a second synchronizer clutch means for selectively individually interconnecting said second input clutch means with said first sun gear member, said ring gear member, and said planet carrier member of said second planetary gearset;

30           a third synchronizer clutch means for selectively individually  
interconnecting said stationary housing member with said sun gear member,  
said ring gear member, and said planet carrier member of said first planetary  
gearset;

          a fourth synchronizer clutch means for selectively individually  
35   interconnecting said ring gear member means and said planet carrier member  
of said first planetary gearset with said output shaft.

6. The dual input clutch transmission defined in Claim 5 further  
comprising:

          during a reverse speed ratio, said input shaft being interconnected  
with said output shaft through said first input clutch means, first  
5   synchronizer clutch means said sun gear member of said first planetary  
gearset, said ring gear member means, and said fourth synchronizer clutch  
means, and said planet carrier member of said first planetary gearset being  
connected with said stationary housing member;

          during a first forward speed ratio, said input shaft being  
10   connected with said output shaft through said first input clutch means, said  
first synchronizer clutch means, said sun gear member of said first planetary  
gearset, said planet carrier member of said first planetary gearset and said  
fourth synchronizer clutch means, said ring gear member means being  
connected with said stationary housing member through said third  
15   synchronizer clutch means;

          during a second forward speed ratio, said input shaft being  
connected with said output shaft through said second input clutch means, said  
second synchronizer clutch means, said first sun gear member and said  
planet carrier member of said second planetary gearset;

20           during a third forward speed ratio, said input shaft being  
connected with said output shaft through said first input clutch means, said  
first synchronizer clutch means, said ring gear member means, said planet

carrier member of said first planetary gearset, said fourth synchronizer clutch means, and said sun gear member being connected with said stationary housing member through said third synchronizer clutch means;

25                   during a fourth forward speed ratio, said input shaft being connected with said output shaft through said second input clutch means, said second synchronizer clutch means and said planet carrier member of said second planetary gearset;

30                   during a fifth forward speed ratio, said input shaft being connected with said output shaft through said first input clutch means, said first synchronizer clutch means, said planet carrier member of said first planetary gearset, said ring gear member means, said fourth synchronizer clutch means, and said sun gear member being connected with said stationary housing member through said third synchronizer clutch means; and

35                   during a sixth forward speed ratio, said input shaft being connected with said output shaft through said second input clutch means, said second synchronizer clutch means, said ring gear member of said second planetary gearset, and said planet carrier member of said second planetary gearset.

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7. The dual input clutch transmission defined in Claim 5 further comprising:

5                   said first input clutch means being engaged in concert with a plurality of combinations of engagements of said first synchronizer clutch means, said third synchronizer clutch means, and said fourth synchronizer clutch means to establish three forward speed ratios and one reverse speed ratio between said input shaft and said output shaft through said first planetary gearset.

8. The dual input clutch transmission defined in Claim 5 further comprising:

said second input clutch means being engaged in concert with a plurality of combinations of engagements of said second synchronizer clutch  
 5 means to establish three forward speed ratios between said input shaft and said output shaft through said second planetary gearset.

9. The dual input clutch transmission defined in Claim 5 further comprising:

said first input clutch means being engaged in concert with a plurality of combinations of engagements of said first synchronizer clutch  
 5 means, said third synchronizer clutch means, and said fourth synchronizer clutch means to establish a first, a third, and a fifth forward speed ratio and one reverse speed ratio between said input shaft and said output shaft through said first planetary gearset;

said second input clutch means being engaged in concert with a  
 10 plurality of combinations of engagements of said second synchronizer clutch means to establish a second, a fourth, and a sixth forward speed ratio between said input shaft and said output shaft through said second planetary gearset;

said second forward speed ratio having a numerical value  
 15 intermediate numerical values of said first and third forward speed ratios and said second synchronizer clutch means being positionable to said second forward speed ratio when either said first or third forward speed ratio is operable;

said fourth forward speed ratio having a numerical value  
 20 intermediate numerical values of said third and fifth forward speed ratios and said second synchronizer clutch means being positionable to said fourth forward speed ratio when either said third or fifth forward speed ratio is operable; and

25       said sixth forward speed ratio having a numerical value greater  
than the numerical value of said fifth forward speed ratios and said second  
synchronizer clutch means being positionable to said sixth forward speed  
ratio when said fifth forward speed ratio is operable.

10. The dual input clutch transmission defined in Claim 9 further  
comprising:

5       said first, third and fourth synchronizer clutch means being pre-  
selectable to said first forward speed ratio when said second forward speed  
ratio is operable;

      said first, third and fourth synchronizer clutch means being pre-  
selectable to said third forward speed ratio when either said second or fourth  
forward speed ratios are operable; and

10       said first, third and fourth synchronizer clutch means being pre-  
selectable to said fifth forward speed ratio when either said fourth or sixth  
speed ratio is operable.